U.S. Fire Administration

Topical Fire Research Series

March 2001

Vol. 1, Issue 14

Dormitory Fires

Federal Emergency Management Agency
United States Fire Administration
National Fire Data Center
Emmitsburg, Maryland 21727

OTHER RESEARCH TOPICS OF INTEREST

To request additional information, or to comment on this paper, visit

http://www.usfa.fema.gov/feedback/

FINDINGS

- Dollar loss and fatalities per dormitory fire are one-third of the national average.
- Dormitory fires occur most often when school is in session.
- 33% of dormitory fires are the result of arson, which is more than twice that of arson fires in residential structures.
- Most injuries (56%) from dormitory fires are incurred while the victim attempts to suppress the blaze.
- Smoke alarms operated in 79% of dormitory fires, twice the number as in residences. Alarms were present in 93% of dormitory fires.

Each year in the United States. there are an estimated 1,300 fires in high school, private and prep school, and university dormitories. These fires are responsible for less than 5 deaths, and approximately 50 injuries and $4.1 million in property loss annually.[1] This topical report examines the characteristics of fires coded in the National Fire Incident Reporting System (NFIRS) occurring in dormitories.

Loss Measures

Figure 1 compares the loss measures for all residential structure fires and those in dormitories. Dormitory fires tend to cause significantly less damage and slightly fewer injuries than general residential structure fires. No dormitory fatalities were recorded in NFIRS from 1996 to 1998.

Time of Year

Most dormitory fires occur while schools are in session, between September and May (Figure 2). Fire incidence declines significantly during breaks, evidenced by the low percentage of fires occurring during the winter recess (December and January) and the spring break (May).

Figure 1. Loss Measures for Dormitory Fires

(3-year average, NFIRS data 1996–98)

MEASURE	ALL RESIDENTIAL FIRES	DORMITORY FIRES
Dollar Loss/Fire	$11,271	$3,045
Injuries/1,000 Fires	48.0	45.7
Fatalities/1,000 Fires	7.7	0

Cause

Figure 3 shows the leading causes of dormitory fires. One-third of dormitory fires are reported as arson (incendiary/suspicious). This is two and a half times greater than the incidence of arson in all residential structures. Cooking, the leading cause of residential fires, is the second leading cause in dormitories (21%). Smoking is the third leading cause of dormitory fires (14%), more than twice the incidence as that in all residential fires. Open flame fires are also higher in dormitories, perhaps due to the popularity of using candles for decorative purposes among college students.

Materials Ignited?

Paper is the leading material ignited (32%) in dormitory fires. This may be related to the incidence of smoking fires, as smoldering cigarettes might be tossed into a trash can. Other materials that ignite in dormitory fires are fabrics (11%), food/starch (10%), and fat/grease (9%).

Injuries

Figure 4 illustrates the leading activities of dormitory fire victims at the time they are injured. Victims in dormitory fires are more likely to be involved in fire control (56%) than victims generally in residential structures (37%).

Figure 5 shows the leading dormitory locations of fire victims at the time the fire is ignited. Not surprisingly, victims tend to be in the same room as the fire. Because of the nature of dormitory living, where communal space is often at a minimum, students likely spend significant time in their rooms. Given the high incidence of smoking fires, it is interesting to note that dormitory fire

Figure 2. Incidence of Dormitory Fires by Month

(3-year average, NFIRS data 1996–98)

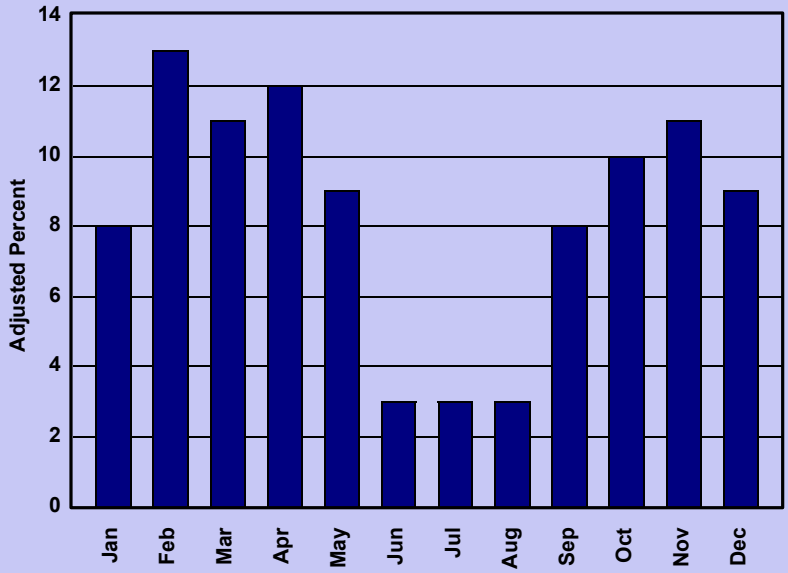

Figure 3. Causes of Dormitory Fires vs. All Residential Structure Fires

(3-year average, NFIRS data 1996–98)

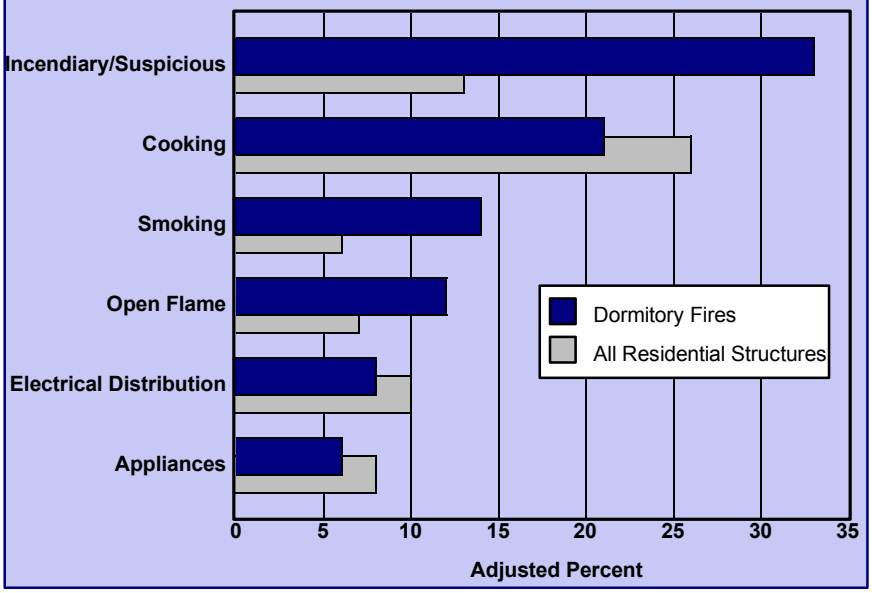

Figure 4. Activity at Time of Injury for Dormitory Fires

(3-year average, NFIRS data 1996–98)

ACTIVITY AT TIME OF INJURY	PERCENT OF CASUALTIES (DORMITORY FIRES)	PERCENT OF CASUALTIES (ALL RESIDENTIAL STRUCTURES)
Fire Control	56	37
Sleeping	24	19
Escaping	16	25

victims are significantly less likely to be intimately involved with the material ignited (e.g., their bedding, furniture, clothing).

Smoke Alarm Performance

Smoke alarms operated in 79% of dormitory fires, twice the rate as in residential structures (Figure 6). Furthermore, alarms were not present in only 7% of dormitory fires versus 39% in residences. Smoke alarms are required by law in dormitories, and their maintenance is the institution's responsibility. This is why it is more likely that an alarm is present and that it is functional (e.g., fresh batteries).

Examples

The following are a few examples of dormitory fires.

- In October 1998, a student was killed in his dorm room after a suspected hazing incident. Seven students were charged with multiple charges, including capital murder, assault, arson, conspiracy to commit arson, and complicity to commit murder.[2]

- In January 2000, three students were killed in a fire that began in a sofa in one of the dorm's common spaces. Nearly 60 other students were injured, five critically, in the early morning fire. Many students initially disregarded the fire alarms because of frequent false alarms in the dorm.[3]

- In April 2000, a student was killed in a fire in her dorm room. Her death was ruled a suicide after authorities concluded she had set her clothing on fire.[4]

Figure 5. Dormitory Location Where Injuries Occur
(3-year average, NFIRS data 1996–98)

LOCATION OF INJURY	PERCENT OF INJURIES (DORMITORY FIRES)	PERCENT OF INJURIES (ALL RESIDENTIAL STRUCTURES)
In Room	52	27
In Building	22	26
On Same Floor	17	24
Intimate	4	15

Figure 6. Smoke Alarm Performance in Dormitory Fires
(3-year average, NFIRS data 1996–98)

ALARM PERFORMANCE	PERCENT IN DORMITORY FIRES	PERCENT IN ALL RESIDENTIAL STRUCTURES
In Room, Operated	62	22
Not in Room, Operated	17	16
In Room, Did Not Operate	7	7
Not in Room, Did Not Operate	4	11
Fire Too Small To Activate	4	4
No Alarms Present	7	39

Conclusions

In the wake of a fire at Seton Hall University in January 2000, members of the fire service and various legislative bodies have lobbied for more stringent fire protection regulations for dormitories. In particular, many would like to see laws requiring sprinklers in all dormitories, with older buildings required to be retrofit with sprinkler systems over the next several years.

For further information about dormitory fires and their prevention, contact the USFA or your local fire department.

To review the detailed methodology used in this analysis, click **METHODOLOGY**

Footnotes

1. National estimates are based on 1996–1998 data from the National Fire Incident Reporting System and the National Fire Protection Association's annual survey, "Fire Loss in the United States," *NFPA Journal*. Because dormitory deaths are rare and because these are statistical estimates based on a sample of fires, it is possible that the estimates reflect no deaths during a time period where a fatal fire occurred.
2. "Campus Feels Relief After 7 Are Charged in Fatal Dorm Fire," *The Associated Press*, October 30, 1998.
3. Mbugua, Martin, "Pain Grips Seton Hall U; Students Try To Cope in Wake of Fatal Fire," *The New York Daily News*, January 21, 2000.
4. "Shin Death Is Ruled a Suicide," *MIT News Office*, May 31, 2000.